

IN THE CLAIMS:

61

1. (Previously Amended) A circular saw comprising:
a table having an upper surface for placing a workpiece thereon;
a saw unit having a saw blade mounted thereon;
means for supporting said saw unit on said table, said supporting means enabling said saw unit to move in a horizontal direction parallel to said upper surface of said table and to move in a vertical direction relative to said upper surface of said table; and
at least one of first lock means and second lock means, wherein said first lock means automatically prevents said saw unit from moving in the horizontal direction upon detection of movement of said saw unit in the vertical direction by a first sensing means, and the second lock means automatically prevents said saw unit from moving in the vertical direction upon detection of movement of said saw unit in the horizontal direction by a second sensing means.
2. (Previously Amended) The circular saw as defined in claim 1 wherein the circular saw includes the first lock means and said first lock means comprises a fixing member releasably fixing said saw unit in position relative to said table in the horizontal direction and an actuator coupled to and selectively operating said fixing member.
3. (Previously Amended) The circular saw as defined in claim 2 wherein:
said support means includes a support arm mounted on said table, a slide member horizontally slidable relative to said support arm, and hinge means for vertically pivotally connecting said saw unit to said slide member; and

wherein said fixing member releasably fixes said slide member in position relative to said support arm when said first sensing means detects said vertical pivotal movement of said saw unit relative to said slide member.

4. (Previously Amended) The circular saw as defined in claim 3 wherein:
said slide member comprises a slide shaft slidably inserted into a shaft holder provided on said support arm;

said fixing member comprises a screw inserted into a threaded hole formed in said shaft holder in a direction perpendicular to a longitudinal axis of said slide shaft, said screw having one end arranged and constructed to abut said slide shaft; and

wherein said actuator rotates said screw in both clockwise and counterclockwise directions so as to move said screw toward and away from said slide shaft.

5. (Previously Amended) The circular saw as defined in claim 4 further including a dust cover mounted on said holder and covering said actuator and said screw, thereby protecting said actuator and said screw from the outside environment.

6. (Previously Amended) The circular saw as defined in claim 4 wherein:
said first sensing means comprises a detector plate mounted on one of said slide shaft or said saw unit, and an optical sensor mounted on the other of said slide shaft and said saw unit;

said detector plate having a plurality of parallel identification bars marked thereon, and said parallel bars being spaced from each other by a predetermined distance; and

1586 2007 11
wherein said optical sensor detects movement of said parallel identification bars as a change in a reflected light pattern.

7. (Previously Amended) The circular saw as defined in claim 1 wherein the circular saw includes the second lock means and said second lock means comprises a fixing member releasably fixing said saw unit in position relative to said table in the vertical direction and an actuator coupled to and selectively operating said fixing member.

8. (Previously Amended) The circular saw as defined in claim 7 wherein:
said support means includes a support arm mounted on said table, a slide member horizontally slidably relative to said support arm, and hinge means for vertically pivotally connecting said saw unit to said slide member; and

wherein said fixing member releasably fixes the pivotal position of said saw unit relative to said slide member when said second sensing means detects horizontal sliding movement of said slide member relative to said support arm.

6 |
9. (Previously Amended) The circular saw as defined in claim 8 wherein:
said slide member comprises a slide shaft slidably inserted into a shaft holder provided on said support arm;

said fixing member comprises a screw engaged with a threaded hole formed in said saw unit in a direction parallel to the pivotal axis of said saw unit;

61

said slide shaft having a flange portion that includes an abutting surface extending within a plane perpendicular to the pivotal axis of said saw unit and one end of said screw is arranged and constructed to abut said abutting surface of said flange portion; and

wherein said actuator rotates said screw in both clockwise and counterclockwise directions so as to move said screw toward and away from said abutting surface.

10. (Previously Amended) The circular saw as defined in claim 9 further including a dust cover mounted on said saw unit and covering said actuator and said screw, thereby protecting said actuator and said screw from the outside environment.

11. (Previously Amended) The circular saw as defined in claim 9 wherein:
said second sensing means includes a plurality of parallel identification bars marked on said slide shaft and an optical sensor provided on said shaft holder;
said parallel bars being spaced from each other by a predetermined distance along a longitudinal axis of said slide shaft; and
wherein said optical sensor detects movement of said parallel identification bars as a change in a reflected light pattern.

12. (Original) The circular saw as defined in claim 1 wherein the circular saw includes both said first lock means and second lock means.

13. (Previously Amended) The circular saw as defined in claim 12 wherein:

61

said first lock means includes a first fixing member releasably fixing said saw unit in position relative to said table in the horizontal direction and a first actuator coupled to the first fixing member, said first actuator selectively moving said first fixing member between a locked position and an unlocked position; and

said second lock means includes a second fixing member releasably fixing said saw unit in position relative to said table in the vertical direction and a second actuator coupled to the second fixing member, said second actuator selectively moving said second fixing member between a locked position and an unlocked position.

14. (Previously Amended) The circular saw as defined in claim 13 wherein:

said support means includes a support arm mounted on said table and a slide shaft coupled to the support arm, wherein the slide shaft is slidable horizontally relative to said support arm, and a hinge means coupling the slide shaft to the saw unit, wherein said saw unit can pivot vertically relative to said slide shaft;

wherein said first fixing member fixes said slide shaft in position relative to said support arm when said first sensing means detects vertical pivotal movement of said saw unit relative to said slide shaft; and

wherein said second fixing member fixes the pivotal position of said saw unit relative to said slide shaft when said second sensor means detects horizontal movement of said saw unit relative to said support arm.

15. (Previously Amended) The circular saw as defined in claim 14 wherein:

said slide shaft is slidably received in a shaft holder provided on said support arm;

61

said first fixing member comprises a first screw inserted into a first threaded hole formed in said shaft holder in a direction perpendicular to a longitudinal axis of said slide shaft, one end of said first screw being arranged and constructed to abut said slide shaft;

wherein said first actuator rotates said first screw in both clockwise and counterclockwise directions so as to move said first screw toward and away from said slide shaft;

said second fixing member comprises a second screw inserted into a second threaded hole formed in said saw unit in a direction parallel to the pivotal axis of said saw unit;

and wherein the circular saw further comprises a flange portion having an abutting surface extending within a plane perpendicular to the pivotal axis of said saw unit, one end of said second screw being arranged and constructed to abut said abutting surface of said flange portion; and

wherein said second actuator rotates said second screw in both clockwise and counterclockwise directions so as to move said second screw toward and away from said abutting surface.

16. (Previously Amended) The circular saw as defined in claim 15 further including a first dust cover and a second dust cover, said first dust cover being mounted on said holder and covering said first actuator and said first screw, thereby protecting said first actuator and said first screw from the outside environment, and said second dust cover being mounted on said saw unit and covering said second actuator and said second screw, thereby protecting said second actuator and said second screw from the outside environment.

17. (Previously Amended) The circular saw as defined in claim 15 wherein:
said first sensing means comprises a detector plate mounted on one of said slide shaft
or said saw unit, and a first optical sensor mounted on the other of said slide shaft and said
saw unit;

 said detector plate having a plurality of first parallel identification bars marked
thereon, said first parallel identification bars being spaced from each other by a
predetermined distance;

 wherein said first optical sensor detects movement of said first parallel identification
bars as a change in a reflected light pattern;

 said second sensing means comprises a plurality of second parallel identification bars
marked on said slide shaft and a second optical sensor provided on said shaft holder;

 said second parallel identification bars being spaced from each other by a
predetermined distance along the longitudinal axis of said slide shaft; and

 wherein said second optical sensor detects movement of said second parallel
identification bars as a change in a reflected light pattern.

18. (Previously Amended) An apparatus comprising:
a table,
a saw unit coupled to the table and comprising a saw blade that is movable at least in
a horizontal direction relative to the table and a vertical direction relative to the table and
at least one lock coupled to and disposed between the saw unit and the table, the at
least one lock selected from the group consisting of a first lock and a second lock, wherein:

the first lock is operationally coupled to a first sensor, wherein the first lock automatically prevents the saw blade from moving in the horizontal direction relative to the table when the first sensor detects the saw blade moving in the vertical direction and automatically permits the saw blade to move in the horizontal direction after the first sensor detects the saw blade has stopped moving in the vertical direction and

the second lock is operationally coupled to a second sensor, wherein the second lock automatically prevents the saw blade from moving in the vertical direction relative to the table when the second sensor detects the saw blade moving in the horizontal direction and automatically permits the saw blade to move in the vertical direction after the second sensor detects the saw blade has stopped moving in the horizontal direction.

61
19. (Previously Added) An apparatus as in claim 18 wherein the apparatus comprises both said first lock and said second lock.

20. (Cancelled)

21. (Previously Amended) An apparatus as in claim 19, wherein:
the first lock comprises a first actuator coupled to the first sensor and
the second lock comprises a second actuator coupled to the second sensor,
wherein the first and second actuators convert electric signals generated by the sensors into mechanical energy to actuate the first and second locks, respectively.

22. (Previously Amended) An apparatus as in claim 21, further comprising:

a support arm mounted on the table,
a slide shaft coupled to the support arm, wherein the slide shaft is slidable horizontally relative to the support arm and
a vertically pivotable hinge coupling the saw unit to the slide shaft, wherein:
when the first sensor detects vertical pivotal movement of the saw blade relative to the slide shaft, the first lock fixes the slide shaft in a position relative to the support arm and
when the second sensor detects horizontal movement of the saw blade relative to the support arm, the second lock fixes the saw blade in a position relative to the slide shaft.

61
23. (Previously Amended) An apparatus as in claim 22 wherein:
the slide shaft is slidably received in a shaft holder connected to the support arm,
the first lock comprises a first screw inserted into a first threaded hole formed in the shaft holder in a direction perpendicular to a longitudinal axis of the slide shaft, one end of the first screw being arranged and constructed to abut the slide shaft, wherein the first screw is coupled to the first actuator and the first screw is rotatable in both clockwise and counterclockwise directions so as to move the first screw toward and away from the slide shaft,
the second lock comprises a second screw inserted into a second threaded hole formed in the saw unit in a direction parallel to the vertical pivotal axis of the apparatus, and wherein the apparatus further comprises a flange portion having an abutting surface extending within a plane perpendicular to the vertical pivotal axis of the saw blade, one end of the second screw being arranged and constructed to abut the abutting surface of the flange portion, wherein the second screw is coupled to the second actuator and the second

screw is rotatable in both clockwise and counterclockwise directions so as to move the second screw toward and away from the abutting surface.

24. (Previously Amended) An apparatus as in claim 23 further comprising:

a first dust cover covering and protecting the first actuator and the first screw from the outside environment and

a second dust cover covering and protecting the second actuator and the second screw from the outside environment.

25. (Previously Amended) An apparatus as in claim 24 further comprising:

a first detector plate mounted on either the slide shaft or the support arm, wherein the first sensor includes a first optical sensor mounted on the other of the slide shaft and the support arm, the first detector plate having a plurality of first parallel identification bars that are spaced from each other by predetermined distances, and the first optical sensor is disposed in relation to the first detector plate such that the first optical sensor detects movement of the first parallel identification bars as a change in a reflected light pattern and

a plurality of second parallel identification bars marked on the slide shaft, wherein the second sensor includes a second optical sensor coupled to the shaft holder, the second parallel identification bars are spaced from each other by predetermined distances in the longitudinal axis of the slide shaft and the second optical sensor is disposed in relation to the second parallel identification bars such that the second optical sensor detects movement of the second parallel identification bars as a change in a reflected light pattern.

26. (Previously Amended) An apparatus comprising:

a table having a surface for placing a workpiece thereon,

a saw unit having a saw blade,

a first means for enabling the saw unit to move in a horizontal plane that is parallel to the surface of the table, the first means being coupled to the table and the saw unit,

a second means for enabling the saw unit to move in a vertical plane relative to the surface of the table, the second means being coupled to the table and the saw unit,

a first sensor detecting movement of the saw unit in the vertical plane,

a first lock operably coupled to the first means and the first sensor, wherein the first lock automatically prevents horizontal movement of the saw unit upon detection by the first sensor of the saw unit pivotally moving in the vertical plane,

a second sensor detecting movement of the saw unit in the horizontal plane and

a second lock operably coupled to the second means and the second sensor, wherein the second lock automatically prevents vertical pivotal movement of the saw unit upon detection by the second sensor of the saw unit moving in the horizontal plane.

27. (Previously Amended) An apparatus as in claim 26, wherein the first lock comprises a first screw, wherein the first screw releasably fixes the saw unit in position relative to the table in the horizontal plane when the first screw engages the first means.

28. (Previously Amended) An apparatus as in claim 27 further comprising:

a first actuator coupled to the first sensor and the first screw, wherein the first actuator rotates the first screw in response to detection by the first sensor of pivotal movement of the saw unit in the vertical plane.

29. (Previously Amended) An apparatus as in claim 28, wherein the second lock comprises a second screw, wherein the second screw releasably fixes the saw unit in position relative to the table in the vertical plane when the second screw engages the second means.

30. (Cancelled)

31. (Cancelled)

32. (Cancelled)

33. (Previously Amended) An apparatus comprising:
a table;
a saw coupled to the table, the saw being movable at least in a horizontal direction relative to the table and a vertical direction relative to the table;
a sensor coupled to the saw or the table and disposed in a position to detect movement of the saw in the vertical direction relative to the table and
a lock operably coupled to the sensor, wherein the lock automatically prevents horizontal movement of the saw upon detection by the sensor of the saw moving in the vertical direction relative to the table.

34. (Previously Amended) An apparatus comprising:

a table;
a saw coupled to the table, the saw being movable at least in a horizontal direction relative to the table and a vertical direction relative to the table;
a sensor coupled to the saw or the table and disposed in a position to detect movement of the saw in the horizontal direction relative to the table and
a lock operably coupled to the sensor, wherein the lock automatically prevents vertical movement of the saw upon detection by the sensor of the saw moving in the horizontal direction relative to the table.

35. (Previously Amended) An apparatus comprising:
means for supporting a workpiece,
means for cutting the workpiece,
means for enabling the cutting means to move in a plane that is parallel to the workpiece supporting means,

means for enabling the cutting means to move towards and away from the workpiece supporting means,

first sensing means for sensing movement of the cutting means towards the workpiece supporting means and

first means for automatically preventing the cutting means from moving in the plane parallel to the workpiece supporting means upon detection by the first sensing means of the cutting means moving towards the workpiece supporting means, wherein the first means for automatically preventing the cutting means from moving in the plane parallel to the workpiece supporting means is in communication with the first sensing means.

36. (Currently Amended) An apparatus as in claim 35, further comprising:
second sensing means for sensing movement of the cutting means in the plane
parallel to the workpiece supporting means and
second means for automatically preventing the cutting means from moving towards ~~the~~ a table
surface upon detection by the second sensing means of the cutting means moving in the plane parallel to
the workpiece supporting means, wherein the second means for automatically preventing the cutting
means from moving towards the table surface is in communication with the second sensing means.

37. (Previously Amended) An apparatus as in claim 35, further comprising means for
enabling the cutting means to laterally pivot relative to the workpiece supporting means so as
to permit bevel cutting operations.

61

38. (Currently Amended) An apparatus comprising:
means for supporting a workpiece,
means for cutting the workpiece,
means for enabling the cutting means to move in a plane that is parallel to the
workpiece supporting means,
means for enabling the cutting means to move towards and away from the workpiece
supporting means,
means for sensing movement of the cutting means in the plane parallel to the
workpiece supporting means and

means for automatically preventing the cutting means from moving towards the workpiece supporting means upon detection by the sensing means of the cutting means moving towards the workpiece supporting means in the plane parallel to the workpiece supporting means, wherein the means for automatically preventing the cutting means from moving towards the workpiece supporting means is in communication with the means for sensing movement of the cutting means in the plane parallel to the workpiece supporting means.

39. (Previously Amended) An apparatus as in claim 38, further comprising means for permitting the cutting means to laterally pivot relative to the workpiece supporting means so as to permit bevel cutting operations.

40. (Previously Amended) An apparatus comprising:

61

a table having a surface for supporting a workpiece,

a saw coupled to the table, the saw being movable at least in a direction parallel to the table surface and being movable towards and away from the table surface,

a sensor detecting pivotal movement of the saw towards the table surface and a lock operably communicating with the sensor, wherein the lock is arranged and constructed to automatically prevent movement of the saw parallel to the table surface upon detection by the sensor of the saw pivotally moving towards the table surface.

41. (Previously Amended) An apparatus as in claim 40, further comprising:

a support arm coupled to the table,

a shaft holder connected to the support arm,
a shaft slidably received within the shaft holder and
a hinge coupling the shaft holder to the saw, the hinge permitting movement of the saw towards and away from the table surface.

42. (Previously Amended) An apparatus as in claim 41, further comprising a screw threadably engaged within the shaft holder and a solenoid in communication with the sensor and coupled to the screw, wherein the solenoid rotates the screw to engage the shaft upon detection by the sensor of the saw moving towards the table surface, whereby movement of the saw parallel to the table surface is prevented.

43. (Previously Added) An apparatus as in claim 42, further comprising a lateral pivot mechanism coupled to the support arm, the lateral pivot mechanism enabling the saw to be inclined relative to the table surface for bevel cutting operations.

44. (Previously Amended) An apparatus comprising:
a table having a surface for supporting a workpiece,
a saw coupled to the table, the saw being movable at least in a direction parallel to the table surface and being movable towards and away from the table surface,
a sensor detecting movement of the saw parallel to the table surface and
a lock operably communicating with the sensor, wherein the lock is arranged and constructed to automatically prevent movement of the saw towards the table surface upon detection by the sensor of the saw moving parallel to the table surface.

45. (Previously Amended) An apparatus as in claim 44, further comprising:
a support arm coupled to the table,
a shaft holder connected to the support arm,
a shaft slidably received within the shaft holder and
a hinge coupling the shaft holder to the saw, the hinge permitting vertical pivotal movement of the saw towards and away from the table surface.

46. (Previously Added) An apparatus as in claim 45, further comprising a screw arranged and constructed to the hinge and a solenoid in communication with the sensor and coupled to the screw, wherein the solenoid rotates the screw to engage the hinge upon detection by the sensor of the saw moving parallel to the table surface, whereby movement of the saw towards the table surface is prevented.

47. (Previously Added) An apparatus as in claim 46, further comprising a lateral pivot mechanism coupled to the support arm, the lateral pivot mechanism enabling the saw to be inclined relative to the table surface for bevel cutting operations.

61

48. (Previously Amended) An apparatus comprising:

a table having a surface arranged and constructed to support a workpiece,
a saw unit having a saw blade,
a support arm coupled to the table,
a shaft holder connected to the support arm,

a shaft slidably received within the shaft holder, the shaft permitting the saw unit to move parallel to the table surface and

a hinge coupling the shaft to the saw unit, the hinge permitting the saw unit to move towards and away from the table surface,

a first sensor detecting movement of the saw unit parallel to the table surface,

a second sensor detecting movement of the saw unit towards the table surface,

a first lock communicating with the first sensor, wherein the first lock is arranged and constructed to automatically prevent movement of the saw unit towards the table surface without operator assistance upon detection by the first sensor of the saw unit moving parallel to the table surface and

a second lock communicating with the second sensor, wherein the second lock is arranged and constructed to automatically prevent movement of the saw unit parallel the table surface without operator assistance upon detection by the second sensor of the saw moving towards the table surface.

49. (Previously Amended) An apparatus as in claim 48, further comprising a screw threadably engaged within the shaft holder and a solenoid in communication with the sensor and coupled to the screw, wherein the solenoid rotates the screw to engage the shaft upon detection by the sensor of the saw moving towards the table surface, whereby movement of the saw parallel to the table surface is prevented.

61

50. (Previously Added) An apparatus as in claim 49, further comprising a lateral pivot mechanism coupled to the support arm, the lateral pivot mechanism enabling the saw to be inclined relative to the table surface for bevel cutting operations.

51. (Previously Amended) A method for cutting a workpiece comprising:

moving a saw unit comprising a saw blade in a plane parallel to a surface of a table, wherein the table is pivotally coupled to the saw unit and the workpiece is disposed on the table surface,

detecting movement of the saw blade in a plane parallel to the table surface by a sensor disposed proximally to the saw blade,

communicating the detection by the sensor of the parallel movement to a lock operably coupled to the saw unit, and

actuating the lock in order to prevent movement of the saw blade towards the table surface.

52. (Previously Amended) A method for cutting a workpiece comprising:

moving a saw unit comprising a saw blade toward a surface of a table, wherein the table is pivotally coupled to the saw unit and the workpiece is disposed on the table surface,

detecting movement of the saw blade toward the table surface by a sensor disposed proximally to the saw blade,

communicating the detection by the sensor of movement toward the table surface to a lock operably coupled to the saw unit, and

actuating the lock in order to prevent movement of the saw blade in a plane parallel to the table surface.

53. (Currently Amended) An apparatus for cutting a workpiece comprising:
means for moving a saw unit ~~comprising a saw blade~~ in a plane parallel to a surface of a table, wherein the saw unit comprising a saw blade and the table is pivotally coupled to the saw unit,

means for detecting movement of the saw blade in a plane parallel to the table surface, the detecting means being disposed proximally to the saw blade,

means for communicating the detection by the detecting means of the parallel movement to a lock operably coupled to the saw unit, and

means for actuating the lock in order to prevent movement of the saw blade towards the table surface.

54. (Currently Amended) An apparatus for cutting a workpiece comprising:
means for moving a saw unit ~~comprising a saw blade~~ toward a surface of a table, wherein the saw unit comprising a saw blade and the table is pivotally coupled to the saw unit,

means for detecting movement of the saw blade toward the table surface, the detecting means being disposed proximally to the saw blade,

means for communicating the detection by the detecting means of movement toward the table surface to a lock operably coupled to the saw unit, and

means for actuating the lock in order to prevent movement of the saw blade in a plane parallel to the table surface.

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Conclusion